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**Embodiment in high-altitude mountaineering: Sensing and  
working with the weather**



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## **Abstract**

In order to address sociological concerns with embodiment and learning, in this article we explore the ‘weathering’ body in a currently under-researched physical-cultural domain. Weather experiences, too, are under-explored in sociology, and here we examine in-depth the lived experience of weather, and more specifically ‘weather work’ and ‘weather learning’, in one of the most extreme and corporeally-challenging environments on earth: high-altitude mountains. Drawing on a theoretical framework of phenomenological sociology, and an interview-based research project with 19 international, high-altitude mountaineers, we investigate weather as lived and experienced both corporeally and cognitively. We are particularly interested in conceptualising and theorising the ways in which embodied beings relate to the environment through different aspects of their being. The novel concepts of ‘weather work’ and ‘weather learning’, we argue, provide salient examples of the mind-body-world nexus at work, as an embodied practice and mode of thinking, strongly contoured by the physical culture of high-altitude mountaineering.

Keywords: climbing body, embodiment, mountaineers, phenomenology, weather, weather work

## **Introduction**

Climbing is all about suffering in my opinion, y'know, you carry a heavy load and you battle the cold plus the high wind, altitude, fatigue, a lot, you're not sitting on the beach (laughs), but some people enjoy that, I enjoy that. (Interviewee)

Via a sociological-phenomenological perspective, our purpose here is to contribute fresh analytic insights to the literature in the sociology of the body and physical cultures, and current

discussions of embodiment, social agency and embodied learning (e.g., Shilling, 2017). We explore lived experiences of weather, a topic that has received surprisingly little (social scientific) academic attention (Rantala *et al.*, 2011). In utilising a sociologised form of phenomenology, we also address the call from sociologists of the body to theorise *from* – and not just *about* lived bodies (e.g. Wacquant, 2004; Williams and Bendelow, 1998), as noted by Crossley (1995) and others (Hockey and Allen-Collinson, 2007; Pitts-Taylor, 2015) working with forms of ‘carnal sociology’. Our particular interest lies in conceptualising and theorising the ways in which embodied beings relate to the environment, and our concept of ‘weather work’ provides a salient example of the mind-body-world nexus at work, as an embodied practice and mode of thinking. To explore the role of weather work, we draw on findings from interviews with 19 high-altitude mountaineers, a physical-cultural group currently under-researched within sociology. Their accounts provide detailed examples of the cognitive-corporeal-environment nexus at work on the ground and in the rarefied air of high altitude, where the weather is notoriously mercurial and unpredictable. As exemplified in the data extract above, ‘living’ the weather is an integral part of high-altitude mountaineering, requiring of climbers close attention to, and monitoring of, both weather conditions and bodily responses, in order to survive.

To date, weather has received surprisingly little sociological attention as a core topic of inquiry, despite the significance of weather in everyday life (Allen-Collinson, 2018; Ingold, 2007, 2010; Ingold and Kurttila 2000; Rantala *et al.*, 2011; Vannini *et al.*, 2012); this article addresses that research lacuna. As these authors note, the ways in which people sense and comprehend meteorological processes and imbue them with significance is of social-science interest. Our findings thus contribute to a small sociological (and anthropological) literature on weather (for example, Vannini *et al.* 2012, Mason 2016) and ‘weather-worlds’ (Ingold 2010), in our case the high-altitude weather-world.

Learning to engage with (and survive) weather conditions often requires an active, proactive, agentic, sense-making, sometimes reflexive, form of work, which we have termed weather work (Allen-Collinson, 2018; Allen-Collinson *et al.*, 2018), defined and explained below. First, to situate the study, we provide a brief review of the small sociological research literature on high-altitude mountaineering. We then portray our theoretical perspective, before describing the research project from which our data are drawn. The findings are subsequently analysed and presented under two key themes that emerged from the interviews: 1) Weather work and somatic attunement at high altitude; and 2) weather-wise decision making.

### **The high-altitude world**

‘High-altitude mountains’ are defined as those standing at 8,000 metres (and over) above sea level; an extreme environment that includes some of the most hostile and dangerous terrain on earth for the human body. In places such as the high mountains of the Himalaya, oxygen is thin and survival is physically-demanding, challenging and tenuous (Burke *et al.*, 2008; Burke *et al.*, 2010). Mountaineers are able to survive for only short periods at heights in and above the ‘death zone’ of 8000m, where a myriad of challenges such as deep crevasses, avalanches, rock- and ice-falls make the high-altitude form of mountaineering an extremely dangerous pursuit. In terms of difficulties posed by weather and atmospheric conditions, the corporeal risks emanating from reduced oxygen at high-altitude, and also extremely low temperatures, are severe. Hypothermia, frostnip and frostbite, acute mountain sickness, pulmonary and cerebral oedema are just some of the considerable corporeal challenges that confront those who venture to these heights.

For successful climbing, therefore, and for very survival, it is essential that mountaineers learn how to assess, evaluate, engage with and also endure severe weather conditions, by developing a ‘weathering’ attitude (Vannini *et al.*, 2012) or ‘weather endurance’ (Allen-

Collinson, 2018; Hockey and Allen-Collinson, 2016). Human ‘weathering’ requires an active and practical disposition to endure, to sense and make sense of, to struggle with and adapt to, weather. This sense of active, reflexive, sometimes mindful and deliberative, engagement with the weather and weather conditions, is integral to what we term weather work (see Allen-Collinson, 2018), further portrayed below. Our data revealed the salience of weather engagement and weather work as integral components of high-altitude mountaineering, where experienced mountaineers learnt via sensory weather learning to develop a ‘feel for’ weather conditions and their impact upon bodily health and safety in the high mountains. For, as Ingold and Kurttila (2000) remind us, knowledge of weather is not something that is handed down as customary prescriptions or formulae, but rather it grows through time spent in a place, moving in its environs. As experienced mountaineers, interviewees often described drawing on this experientially-grounded sense of, and feel for, weather.

Sociologically-speaking, high-altitude mountaineering is currently an under-researched physical culture (Allen-Collinson *et al.*, 2017), and we provide here a brief review of some of the research germane to our project. An earlier Mount Everest disaster of 1996, for example, is analysed by Elmes and Frame (2008) via a Foucauldian framework, whilst an ethnographic study of an expedition to climb Everest (Burke *et al.*, 2008) employs ethnomethodology to examine mountaineers’ sense-making activity. Ewert (1994) has highlighted how some mountaineers are sensation-seekers, with normative constructions of danger differing substantively from those of the general public. The ‘edgework’ elements of high-altitude mountaineering have also been considered (see Simon, 2005), drawing on Lyng’s (2005) portrayal of edgework as spanning a range of transgressive and challenging experiences that involve risking death, or at least incurring serious injury.

Bunn’s (2016) work focuses on Alpine-style climbing in the USA, drawing on a Bourdieusian framework. Pereira (2009) considers meaning-making amongst high-altitude

mountaineers vis-à-vis risk-taking as normatively transgressive action. From a psychological perspective, Fawcett's (2011) phenomenologically-oriented study investigates mental toughness in mountaineering. Relatedly, a strong goal orientation perspective was identified in research undertaken by Wickens *et al* (2015), where some high-altitude mountaineers were found to pursue doggedly a 'summit or die' approach. Also from a psychological perspective, and in relation to weather concerns, Bassi and Delle Fave (2010) examined the role of goal-setting and motivation during a Himalayan expedition affected by a prolonged weather emergency.

Returning to mountaineering more generally, researchers have considered gender in high-altitude mountaineering: for example, Ortner (1999), Fröhlick (1999-2000) and Jordan (2005) all critically analyse the gender politics at play in what they portray as the 'hypermasculine world' of high-altitude mountaineering. Gugglberger's (2015) detailed historical analysis charts Nepalese women's mountaineering, together with the development of 'Western' women's expeditions to the high mountains of the Himalaya. In this work, Gugglberger (2015: 598) highlights the eighteenth- and nineteenth-century idealised image of a climber as constructed in conformity with traditional notions of masculinity, closely linked to grand, 'heroic', and highly nationalised discourses. Few women were traditionally involved in Himalayan expeditions even towards the turn of the twentieth century, other than as 'assistants' or 'appendages': women 'accompanying' their heroic husbands (Gugglberger, 2015). This historical legacy is only gradually being challenged, and today women represent around five per cent of high-altitude climbers, with numbers increasing steadily (Jordan, 2005).

In sum, then, there have been relatively few sociological accounts investigating high-altitude mountaineering, and none we could identify at the time of the research, which specifically examined the lived experience of weather in the rarefied atmosphere of high altitude. Here, we are particularly interested in addressing Shilling's (2017) call for sociology

to address some of the challenges associated with learning cognitively, sensorily and practically. Weather learning and weather work provide examples of this corporeal and cognitive linkage, played out, in this case, in the world of high-altitude mountaineering. Before proceeding to describe the mountaineering research, we first delineate briefly our theoretical framework of phenomenological sociology.

### **Phenomenological sociology: studies of the life-world**

Developed from Husserl's (1900/1901; 2001) philosophical oeuvre, phenomenology nowadays comprises a rich and complex weave of different theoretical and empirical threads (Allen-Collinson, 2011), focussing on the scholarly investigation of phenomena – things as they appear to the conscious mind. The term 'phenomenology' derives from the Greek root *phôs* (light), thus meaning something perceived or 'placed in the light' in consciousness. For Husserl (1900/1901; 2001), a key purpose of his phenomenological method was to identify and return 'to the things themselves' (*zu den sachen selbst*), as far as possible devoid of everyday (including scientific) presuppositions and preconceptions enveloping and obscuring phenomena. Via the phenomenological method, he sought to suspend the 'natural attitude', our everyday, often tacit, taken-for-granted assumptions and presuppositions, by employing the phenomenological *epochē* (a form of bracketing). As social scientists employing a phenomenologically-inspired approach to undertake empirical research, we are cognisant of the impossibility of achieving full *epochē*, not least in acknowledging our inability completely to step outside of our socialisation and socio-cultural structures, including language (Allen-Collinson, 2011). In phenomenological thinking, mind, body and world are all fundamentally interlinked and intertwined, as exemplified by the French existentialist phenomenologists, including de Beauvoir and Merleau-Ponty. Merleau-Ponty (1969), for example, highlights the continuity of mind-body-world with his use of the French term *chair*, or 'flesh-of-the-world' –

to portray that we humans are made of the very fabric that unites all things. This continuity of world and body emerged strongly from our weather-related data where, for example, the cold ‘thin’ air of high altitude is drawn (sometimes with difficulty) into mountaineers’ lungs, where oxygen then ‘merges’ with chemicals in the red blood cells.

In terms of phenomenological influences upon sociology, Husserlian insights were developed within sociology by Schütz (1967) who, amongst other things, further elaborated the conceptualisation of the *Lebenswelt* or lifeworld (Schütz and Luckmann, 1973). This world of everyday, of immediate and at-hand experience, is shared with others intersubjectively, and thus ‘co-lived’. Bringing a sociological perspective to bear, Schütz (1967) highlighted how lifeworlds are deeply embedded within social structure. For researchers drawing on a ‘sociologised’ form of phenomenology (see Allen-Collinson, 2011, for a discussion), the influence of social structure, socio-cultural location, together with historical timeframe and specific social context, is of great import. Classic sociological variables such as gender, age, social class, ethnicity, for example, are acknowledged to be fundamental and thorough-going influences on lifeworlds and on lived-body experiences.

Shilling (2017) notes how, increasingly, sociological researchers have utilised Merleau-Ponty’s (e.g. 1969, 2001) existential form of phenomenology to explore the ways in which embodied consciousness is demonstrated, learnt and re-learnt within occupational, sporting and other settings (see also, Hockey and Allen-Collinson, 2007; Allen-Collinson, 2018; Kupers, 2005), such as the physical culture of mountaineering (Allen-Collinson *et al.*, 2017). Also germane to the current research, Leder (1990) identifies how, from a phenomenological perspective, when discomfort, pain or other intense sensations disrupt our everyday, taken-for-granted state of corporeal ‘disappearance’ from conscious mind, the body then ‘dys-appears’, constituting an object of our intentionality. This happens in the high-altitude environment when



the body ‘dys-appears’, sometimes acutely, for example with breathing difficulties, intense cold, frostnip, frostbite, fatigue and exhaustion. As we describe above, existential phenomenology emphasizes how our minds and bodies are inextricably braided and interwoven with the fabric of the world. From this perspective, phenomena are not separate from our human consciousness and experience, but rather they form part of our incarnate subjectivity. This interconnectivity emerged strongly from the research data, where mountaineers recounted ‘living’ the weather and ‘mingling’ (Ingold, 2007), albeit it sometimes with discomfort and pain, with the elements.

### **Researching the high-altitude mountaineering life-world**

The research involved in-depth interviews with 19 high-altitude mountaineers, nine of whom were undertaking expeditions on Mount Everest (and one on nearby Makalu) when the 2015 earthquake struck Nepal. As well as expedition members, participants included mountain guides, expedition leaders and medical doctors. Once ethical approval had been granted by the University, purposive sampling was used to assemble our initial cohort of mountaineers, contacted through the personal networks of Authors 2 and 3. Selection criteria were: 1) participants’ direct lived experience of mountaineering for a minimum of 5 years; 2) fluency in the English language; and 3) an ability to describe in detail their lived experience. Subsequently we employed snowball sampling (Markula and Silk, 2011) in order to recruit, via the social networks of the initial group, further participants who met the inclusion criteria. Nineteen high-altitude mountaineers were eventually selected for participation, with a gender ratio of 15 men to four women; a ratio consistent with gender participation rates in ‘extreme’ endurance sports more widely (Schüler *et al.*, 2014). Two participants were also experienced expedition operators, six had acted as guides for less experienced climbers, and two were high-altitude medical doctors. Four participants had established high-altitude climbing records

during their climbing careers, including one participant who had summited all 14 Himalayan 8000m mountains. The mean age of the sample was 42.79 years ( $SD=12.96$  years) with participants having between 5 and 32 years of mountaineering experience.

Given the relative ease of identification of participants (especially the women mountaineers) in such a small mountaineering community, we agreed not to reveal details of their demographic information, in order to protect anonymity. In terms of geographical coverage, participants hailed from the United States ( $n=7$ ), Great Britain ( $n=6$ ), Iran ( $n=1$ ), Germany ( $n=1$ ), New Zealand ( $n=1$ ), Mexico ( $n=1$ ), Australia ( $n=1$ ), and Republic of Ireland ( $n=1$ ). Most interviewees had experience of climbing as part of an expedition-style 'siege' approach, using lines of fixed ropes, establishing camps and stocking up on supplies at points along the route with the aid of specialist guides/porters, often using supplemental oxygen during summit attempts. In contrast, some participants had climbed in Alpine style without fixed-ropes and/or supplemental oxygen, and carrying their own equipment and supplies (see also Bunn, 2016). Whilst the benefits of this latter style include less time spent on the mountain, and concomitantly less time exposed to risks of extreme weather and avalanche, there is correspondingly a shorter period of acclimatisation, and reduced support and protection in terms of food supplies and protective clothing and equipment.

The phenomenologically-inspired interviews were designed to elicit rich, in-depth accounts of participants' lived experiences, and were relatively unstructured, with participants treated as co-producers of the research (Crust *et al.*, 2016; Bevan, 2014). The researchers made best efforts to suspend their presuppositions about the phenomenon of high-altitude mountaineering, including via an initial bracketing interview, so as to encourage interviewees to describe their experiences freely and in as much depth as possible. Gallagher and Zahavi (2008) remind us that phenomenology aims to disclose structures of consciousness that are *intersubjectively* accessible, and the interviews thus provided descriptive accounts co-produced

in the interactional encounter. Interviews lasted between 49 and 118 minutes (*mean* = 72.8 minutes), and SKYPE™ and telephone interviews were also employed, given the geographical scattering of participants. With the potentially sensitive nature of the interview conversations, including discussions of death and injury, all interviewees were reminded they were under no obligation to answer any of our questions. Many reported feeling the benefits of being involved, however, and of having the opportunity to talk about cognitively and corporeally challenging life experiences.

As part of the data analytic process, we employed elements of Giorgi and Giorgi's (2003) approach to empirical phenomenological research, including engagement with the phenomenological *epochē*, a task assisted by the lack of familiarity of one team member with high-altitude mountaineering culture. In-depth reading of, and data-immersion in the transcripts followed, to identify themes and sub-themes. Separate initial 'discovery sheets' of key words, concepts and themes were generated by each researcher, to aid preliminary classification. Comparisons were then made between our independent analyses, to identify salient themes and sub-themes. Initial interpretations and themes were discussed with our participants to help ensure resonance with their lived experiences. All interviewees were provided with their own interview transcript, invited to question our initial interpretations, and offer alternative accounts if they so wished; no one did. Follow-up interviews were also conducted with two participants, to develop a critical dialogue about initial findings. Germane to our phenomenologically inspired approach, the purpose of these subsequent interviews was to stimulate exploration of, and reflection on alternative interpretations.

From the data analysis, several key themes emerged, some of which we have explored elsewhere in relation to mental toughness and endurance in mountaineering (see, for example, Allen-Collinson *et al.*, 2017; Crust *et al.*, 2016; Swann *et al.*, 2016). Here, we focus on the

two weather-related themes that emerged so clearly in the mountaineers' accounts: 1) weather work and somatic attunement; and 2) weather-wise decision-making.

### **Weather work and somatic attunement**

At high altitude, the weather on and around the high peaks is notoriously mercurial, and weather forecasts require careful scrutiny to inform decision-making, as mountaineer and meteorologist, Elizabeth Kennett (2006: 44), notes:

As a mountaineer, I have spent many hours agonising over the weather forecast, knowing that a correct interpretation is crucial for the safety and success of any trip. I have also experienced at first hand the sudden changes in the weather that are notorious in high mountain regions.

Kennett (2006) further delineates that, even with a peak such as Cho Oyu that is relatively rounded and often considered to be the 'easiest' of the fourteen 8,000m Himalayan peaks, the summiting success rate remains only around 30%, with failure to summit mainly attributable to altitude sickness or severe weather. Following the monsoon season, there is a brief 'weather window' of just a few weeks when the weather is generally considered 'good enough' for climbing. Afterward, the Himalayan mountain range becomes exposed to very strong winds associated with the re-establishment of the upper-level subtropical jet stream in the region (Kennett, 2006). During this brief meteorological window of opportunity, at Cho Oyu base camp at around 5700m, temperatures typically range from 10 to 20°C during the day and from -10 to -20°C at night. As an experienced participant noted, choosing the correct time of year and identifying the precise window weather are crucial skills to learn:

There's a lot of skill to choosing the time of year and to pick the windows carefully.

If you don't watch the weather window and you go too soon on your first rotation and have to come back down, you're gonna miss the weather window.

As Kennett (2006) highlights, too, the safety of any expedition depends greatly on mountaineers' 'reading' of the weather and weather forecasts, and also, we would argue, on developing a form of sustained 'weather endurance' (Allen-Collinson, 2018) or weathering attitude (Vannini *et al.* 2012). Vannini and colleagues (2012: 362) describe how: 'To weather is an active, reflexive, practical disposition to endure, sense, struggle, manipulate, mature, change, and grow in processes that, over time, implicate the place-making of one's dwelling'. Flowing from this, we argue that such active, reflexive, sense-making vis-à-vis weather, is integral to weather work. At times, such weather work requires intentional, mindful engagement with the weather, whilst at others such engagement happens at a more pre-reflective, intuitive level, as we portray below. Our conceptualisation of weather work emphasizes that the experience of weather is not only 'received', but also is actively constructed, made sense of, interpreted and re-interpreted, produced and re-produced, and can be narrated and otherwise communicated in social interaction. This perspective then coheres with the conceptualisation of the agentic 'production' of the weather as part of a wider production of sensory embodiment (for example, Allen-Collinson and Owton, 2015; Chau, 2008; Vannini *et al.* 2012), in that we must undertake 'work' in *sensory-production* as well as in *sensory-interpretation*.

High-altitude mountaineers thus have to learn how to interpret, make sense of, and monitor the weather, in order to minimise the bodily risks inherent in their physical-cultural world:

There are many risks that I can minimise by y'know by making the right decisions regarding the weather, er the route... using the right safety gear, going in the right season.

The sociological importance of examining the nexus of physical experiences in conjunction with the role of cognition has been emphasized (Shilling, 2017; Allen-Collinson *et al.*, 2017) in learning embodied processes. At high-altitude, mountaineers must learn, develop, and refine acute situational awareness vis-à-vis both external environmental and internal bodily indicators, and monitor weather and terrain conditions in conjunction: the body-mind-world linkage instantiated. Interviewees thus expressed how crucial it was to be vigilant and to monitor closely the weather and other environmental conditions during both the summit ascent and descent (see also Wickens *et al.*, 2015). For example, during the ascent phase, experienced participants recounted paying close attention to rock formations and other features of the mountain, which could then subsequently aid their route-finding, should the weather deteriorate or the light fade:

I'm always looking over my shoulder. Kind of going 'how do I get down this part?' or to try to remember this section so if it gets dark I can figure it out.

Participants also reported learning how to make sometimes fine-grain differentiations in weather conditions, such as developing ways of identifying different kinds of ice and snow. One highly experienced mountaineer, with over 12 years' experience of climbing in the Himalaya, described different forms of snow and their effects:

The kind of snow that we got, because not all snow is the same, so the snow that we got that afternoon (while waiting at the south col) it was very dry, and very puffy, the kind of snow that would not solidify and create a layer that can then break and avalanche.

And on another occasion:

That snow caused problems on the next stage of climb that we did, as that snow was blown away, not compacted. It just blew away...and it made the climb significantly more uncomfortable for me.

Not only did mountaineers learn how to identify the different material properties of snow, but the relationship between snow type, terrain and angle of slope had to be carefully evaluated, particularly with regard to avalanche risk:

It's not only the type of snow, it's the angle. Avalanches occur usually between 30 and 60 degrees of the slope and I knew which parts of the route had those slopes. I was pretty convinced before we climbed that it would not be a factor.

And another experienced participant recounted the moment when her/his intentionality was suddenly focused on the angle of a slope and imminent danger of avalanche:

Broad Peak, where we were on the summit push and it was bloody hard and we had a lot of snow and we were in the snow up to our hips. I could've gone on, but then all of a sudden it occurred to me that we were in a slope that was completely

in danger of avalanching. There were 16 of us on that slope. We were plodding along when from one second to another it occurred to me. I said: 'whatever you guys are doing, I'm going down.' That was the first time I was really scared. I thought that if this slope comes down then we're all gone. I couldn't wait to get off the mountain.

The role of weather learning in contouring these mountaineers' perception is also salient, and coheres with the phenomenological notion of intentionality. Derived from Brentano (1874/1973) and taken up within Husserlian phenomenology, intentionality delineates how consciousness is always consciousness of *something*; it is intentional, directed or orientated towards something or someone, including the imaginary (Allen-Collinson, 2011). Intentionality thus allows objects to appear as phenomena to the perceiver, shapes our perception and indeed what is made 'available' to us to be perceived. Relatedly, Rantala and colleagues (2011), draw on Gibson's (1994) theorisation of 'affordances' or perceived meaningful units, defined through their relationship to the perceiver. According to this schema, as Rantala *et al.* (2011: 291) delineate, people do not perceive the different qualities of an environment, such as icy conditions, freezing temperatures and the depth of snowdrifts, as separate phenomena but rather as meaningful units, so that, for example, a snowdrift may afford the potential for skiing, tobogganing or a snowball fight. Importantly, too, this process of perception is relative to the skills and capacities of the perceiver, and we add, to experiential learning. Thus, for the mountaineers, decisions regarding what was deemed possible, risky, or too risky depended on perceptions of, for instance, the quality of the particular kind of snow that was falling or had fallen: 'dry', 'puffy', 'compacted', and so on. Different types of snow offered different affordances, and these distinctions had to be learnt gradually over time and with experience as part of mountaineers' weather learning and weather work.



Not only was close attention to forms of snow, ice and other weather-related features required, but also a finely developed ‘somatic attunement’ to corporeal indicators of impending corporeal problems in relation to weather. As Leder (1990: 23) notes, ‘the body is always a field of immediately lived sensations... (its) presence fleshed out by a ceaseless stream of kinaesthesias, cutaneous and visceral sensations’. The salience of sensation and the sensory dimension has been emphasized in much phenomenologically-inspired sociological work, including research into physical cultures (e.g., Allen-Collinson and Hockey, 2011; Hockey, 2006, 2013; Throsby, 2013). Thus, the mountaineers had to learn over time and with experience how to interpret this ceaseless stream of sensations. In cases of discomfort and bodily ‘dys-appearance’ (Leder, 1990), they had to learn how to interpret weather-induced sensations, to make them meaningful within their specific physical-cultural framework, for example, to learn the meaning and significance of feeling of cold extremities within mountaineering, in relation to developing frostnip and frostbite; and then to deal with these sensations by taking appropriate action. Only via lived experience, participants emphasized, could such weather learning and somatic attunement develop:

Going from frostnip to frostbite is very quick so I try not to let it get to that point...

I am 36 years old now and I’ve been doing this since I was 13, and it’s something that you just learn how it feels... It’s something you get from experience, for sure... You can feel the difference between cold and the danger of getting frostbite.

With the cold you feel the discomfort and when you are nearing frostbite you have difficulty even moving your fingers. Like opening and closing the palm of my hand. I’m doing it right now really, really fast, but when I do it and I’m getting close to frostbite it’s like I’m doing it in slow motion. Also, you start losing the

feeling, so for the toes, if I kick my toes on the ice then I feel pain, but if I am going over the curve towards frostbite then I get no pain.

For those less experienced mountaineers, who had not developed such refined somatic attunement via weather work, the corporeal consequences could be dire:

Three of them had really severe frostbite, I'm sure one of them lost all their fingers if not part of the hand, so yeah, if they had that experience they would have known that they needed to turn around and, yeah like I said, inexperience is really dangerous up there.

In such cases, the phenomenological conceptualisation of body-mind-world as braided and intertwined is instantiated. To maintain corporeal safety, mountaineers must develop fine sensory attunement to cutaneous and visceral sensations, for example, drawing on both cognitive and corporeal cues. Such somatic indicators are also important to take into account in the weather-work decision-making process, for example, in deciding whether and when to proceed with a summit attempt or other climbing project.

### **Weather-wise decision making**

Interestingly, the social agency of weather itself has been theorised, with Rantala and colleagues (2011) arguing that the weather holds agency in exerting a significant degree of power in directing and redirecting human activities, including in terms of narrowing down or extending these. In this regard, our mountaineers emphasized the need to develop a weather-wise, calculated approach to decision-making, taking into account the great importance of weather conditions, particularly as these were far beyond their control:

[We] got caught out with some bad weather and the visibility just went really, really diabolical, and it was on a fairly delicate sort of rock traverse part, and once again we decided to just sit it out. But this time it was only for maybe two, three hours until this pretty savage snow storm came by. So literally, [we] just sat that out and then once ... that had cleaned through, we know that the condition then, it was just too much snow on the rocks. So then in our own hearts and knowing, we knew the right decision was then to turn back and go down.

A very experienced mountaineer, who had previously summited Everest on three occasions, described how he drew on past experiential weather learning to balance multiple considerations regarding weather conditions when judging whether the risk of avalanche was an ‘acceptable’ one to take. In the following data extract, he describes deciding whether to continue in his efforts to summit Everest for a fourth time:

The afternoon before I summited we started getting a lot of snow and that affects the climb in several ways. One of them can be avalanche danger, another one is breaking trail, but I had been in that position a few times before at the South Col<sup>i</sup>, also I knew the route. I knew the slopes were...err...the snow that accumulated below, that there could be some avalanche danger, but the risk was acceptable and I went for it.

Another mountaineer similarly alluded to the experiential nature of learning in relation to identifying accurately when weather risks outweighed potential summing rewards:

But also about deciding what's worth it. I turned around on K2 because the snow conditions were poor. I could have kept on going a little bit further but I got to the point where I thought...in theory I can say 'one more step, one more step', but my recognition of risk versus reward is that it's now better [than in earlier climbs], now it's time to turn around... I think it was a good decision that I made over maybe one hour and analysing the conditions and it was not an impulsive decision.

The cognitive-corporeal nexus emerged strongly in the interviews, where mountaineers reported monitoring the weather and other environmental conditions in conjunction with their own somatic indicators and feelings, for example, of intense fatigue and exhaustion. In the following extract, a participant describes moving towards a decision to turn around when attempting to summit K2 in difficult snow conditions, balancing both meteorological and corporeal factors:

We climbed for hours and it was exhausting work, but again that sense of 'I can get to the next camp, I can rest and then we'll go to the top and it will be worth it'. But the snow conditions were very bad, the climbing was very steep, I was getting exhausted... I started to go down a path where things might not be possible to come back from. I realised that yes, I could keep putting one foot in front of the other and I was, but now the image of me summiting was actually rapidly disappearing and it was being replaced by almost an image of me not being able to make it either to the next camp or back to the previous camp.

Further related to the cognitive-corporeal relationship, a pre-reflective, intuitive element also emerged strongly for many climbers, who described developing over time and

with experience a ‘gut feeling’ for weather conditions, including warning signs of danger. Although we have no way of assessing on how many occasions, such gut feelings proved accurate, many experienced mountaineers reported acknowledging that small atmospheric and/or corporeal changes might be subconsciously, intuitively ‘felt’ first, before the cognitive process of decision-making came into play. Such intuitive and sometimes nebulous feelings are commensurate with phenomenology’s interest in exploring the nature of pre-reflective, ‘without words’ or perhaps ‘beyond words’ experiences, often so difficult to capture and articulate (see Allen-Collinson, 2016). As noted above, Merleau-Ponty (1969), in particular, has argued for our existential unity with the *chair* or ‘flesh-of-the-world’, noting how we can experience phenomena at a deeply corporeal, pre-reflective level. As an experienced expedition leader explained:

A gut feeling is, I dare say, all those little subconscious things that you recognise... danger points that you recognise, but subconsciously, and you then start, the body then starts or the mind then starts recognising this and then gives you a warning sign... I think especially for guiding and especially on expeditions you need to recognise that (gut) feeling is there and that it should be part of your decision-making.

Another mountaineer provided a powerful example of this ‘gut feeling’, and the importance of paying attention to such intuitive instances, even when more ‘objective’ indicators seemed unable to provide an adequate explanation for overwhelming feelings of dread and apprehension:

Everything was fine... I climbed direct from base camp to camp two, next day direct from camp two to camp four, I was overtaking other climbers on oxygen, others without gas, I was absolutely flying up there. And then I got just to camp four and then the hairs went up on the back of my neck, literally, went up on the back of my neck. And, and I had this feeling of dread, total shudders through my body and it was... it was just wrong, it was all wrong. And, look I couldn't see anything to tell me why I was wrong, there... the weather was good, my dream of climbing without gas was about to be realised, within a matter of hours, but it was just such a feeling of dread that I turned around and came down again and it, it was a physical feeling, you know, it was a pain in the gut, a clenching of the gut, and literally the hairs on the back of my neck, and then [identifying text removed] a storm came in and I, had I been stuck up there without gas, I would probably would have died up there because I couldn't have got down, and all the other people who had their gas, well they burned it up, just surviving, so... I think my body picked up on a significant drop in pressure, er, that I didn't physically feel but, my body felt it, my brain felt something dropping, erm, but it was such a, a physical feeling that I couldn't ignore it.

Analogously, another participant recalled detecting a certain 'something' s/he had seen happen before, without initially knowing exactly what that something was, but nevertheless recognising at an intuitive level the imminent danger:

...leaving the night time at two o'clock in the morning and you're going, 'this is too windy, it's too windy' and then it's daylight comes and you see the transportation of snow, very high altitude and going, 'this is dangerous, there's

something, I've seen this happen before, this is why I'm feeling nervous' and so then you try to analyse what you've seen.

What commences as a pre-reflective, intuitive process might then shift to a more reflective and deliberative mode, where mountaineers' intentionality is directed toward both external and internal somatic indicators, in conjunction with experiential knowledge about developing weather conditions:

You start looking around and your mind registers stuff that you might not consciously recognise all the time. So when I started looking at all those factors I'm like the avalanche danger is high; the chance of serac [a ridge of ice on the surface of a glacier] collapse is high; we're not moving fast enough; we're not gonna be able to get through the Bottleneck before it's dark, and then I also wasn't feeling 100%. So all of those things combined made it the right decision for me to turn around.

In this particular instance, our participant's experience and decision-making skills proved crucial, for several other mountaineers died on K2 that same day, and his own climbing partner was forced to bivouac high up on the mountain in intense cold, eventually losing several toes to frostbite. Refined attunement to the mind-body-world linkage is thus key, and central to experienced mountaineers' weather work, drawing on what are often hard-won experiential ways of knowing.

## Conclusion

You might be weather bound, stuck in a tent or stuck on stupid rock cliff somewhere and you could be there for maybe I don't know, two to three days, some horrible conditions, and your body and your mind is just saying 'just give up on this, just give up'. And you've just got to weather it out.

As the above participant quote underlines, the weather and weathering are core elements (or structures of experience in phenomenological terms) in the high-altitude physical-cultural world, and the importance of weather and what we have termed weather work emerged across all interviewees' accounts. 'Weathering' and 'weathering it out' did not, however, constitute some innate cognitive or corporeal ability or aptitude; mountaineers had to learn over time and with experience *how* to weather, via deep engagement in weather work. This included learning how to identify and interpret not only environmental changes, sometimes transient and highly nuanced, but also their own corporeal sensations and responses to these changing conditions. Eventually, over time and with hard-won experience, mountaineers described developing a 'feel for' the weather, and how this impacted upon possibilities for action or indeed relative inaction. Often, as illustrated by the data extracts above, and commensurate with phenomenological perspectives (for example, Merleau-Ponty, 1969), mountaineers initially felt, pre-reflectively, at a 'gut level' small, nuanced changes in weather and atmospheric conditions. Then, drawing upon experiential knowledge and ways of knowing weather, developed over time, they could (sometimes) interrogate cognitively these intuitive feelings, and come to a weather-wise decision regarding whether to proceed, wait or abandon a climb altogether.



Via this research, we seek to contribute new insights to contemporary sociological debates both within and beyond the sociology of the body, particularly the need to theorise the interweaving of material body, mind, and environment, in relation to social actors' ways of being and ways of learning. As Williams and Bendelow (1998: 3) argued some time ago, only on the basis of this form of theorising can a 'truly embodied sociology have any real hope of putting minds back into bodies, bodies back into society and society back into the body'. Our research and analysis respond to that particular challenge, and similarly to Shilling's (2017) identification of a need for sociology to address the 'embodied importance of cognition to the incorporation of culture'; in this case, the physical culture of high-altitude mountaineering. Above, we have conceptualised and theorised the ways in which mountaineers as embodied beings relate to the demanding environment of high-altitude. Our novel concepts of weather work and weather learning provide salient examples of the mind-body-world nexus at work, as embodied practice and mode of thinking. Weather work clearly requires both cognitive and corporeal work. Meteorological conditions have to be perceived, acknowledged, interpreted, made sense of, understood, and, in the case of expeditions and group endeavours, communicated in social interaction, as part of the weather work undertaken by mountaineers. The cognitive and corporeal were found to be tightly interwoven, as was evident from the mountaineers' accounts, where mountaineering-mind and mountaineering-body 'weather worked' in close conjunction, synergistically. 'Weathering' can also constitute a pre-reflective habit or capacity developed by mountaineers over time, allowing them 'to feel' their way in and through the mountain environment. Further, and as noted above vis-à-vis sociological and anthropological theorisations of the active social production of the sensory (e.g., Allen-Collinson *et al.*, 2018; Chau 2008; Vannini *et al.*, 2012), social actors must undertake work in *sensory-production* as well as in *sensory-interpretation*, and this insight certainly applies to mountaineers' understanding and 'living' the weather (see also Mason, 2016, in relation to

everyday living of weather), including ‘co-constructing’ (in a sociological sense) weather and weather work in social interaction.

As became clear from the interview data, not everyone was successful in undertaking weather work and in developing an attuned weather sense. Participants’ accounts were replete with instances of other mountaineers ‘pushing on’ despite salutary warnings from more weather-wise co-climbers to abandon the climb, temporarily or permanently. Interviewees were also keen to point out the role of chance or luck in terms of summiting and also in relation to survival, for even the most experienced of mountaineers. As an interviewee noted in regard to a group of fellow climbers, all of whom met their death on Everest: ‘That’s because they were just in the wrong place. Just one of those things. I would say...I would call that luck.’ Weather work, weather sense, and weather wisdom appeared therefore to be necessary but not necessarily sufficient for survival in some of the most dangerous regions on earth, but they could mean the difference between life and death in the high-risk world of high-altitude.

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<sup>i</sup> A sharp-edged pass between Mount Everest and the adjoining mountain, Lhotse, the fourth highest mountain in the world.